

Environmental impact and risk assessment for cationic asphalt emulsion based road applications

Summary

SFERB (the French emulsion manufacturers association) granted INERIS a research budget to develop a standardized method to conduct impact studies and risk assessments related to the road use of asphalt cationic emulsions. INERIS is a public independent laboratory under the supervision of the French Secretary of the Environment; the peer review is conducted by URS International, the private US based engineering firm. The purpose is to assess the impact of the run-off water resulting from the emulsion's breaking process as well as of the wash-off waters resulting from early rainfalls following the road application. Most road asphalt emulsion types of uses are covered in this study such as cold mix base material, chip and seal applications and slurry seals or micro-surfacing.

The first phase of the actual study focuses on cold mix base material: in this situation, the emulsion presents usually a high percentage of emulsifier, i.e. 0.4 to 1.5% surfactant content.

The study identified 3 families of potential pollutants: emulsifiers (amines), TPH (Total Petroleum Hydrocarbons) and PAHs (Polynuclear Aromatic Hydrocarbons). The adsorption and desorption mechanisms related to the unpaved shoulder will be analyzed, so as to assess the resulting impact on the environment outside of the road structure (which includes the unpaved shoulder). The ecotoxicity assessment will target both aquatic and soil organisms. Ecotoxicology tests results will be put in relation with amine, TPH and PAH contents.

The final goal of this study is to design a standardized laboratory protocol for the industry which would allow predicting the environmental impact of old and new asphalt emulsions